Ananthu Rajendran Pillai

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Skills

Programming Languages: Python, C++, SQL, MATLAB

Frameworks & Libraries: NumPy, Pandas, Matplotlib, Scikit-learn, PyTorch, Hugging Face Transformers, LangChain

Tools & Technologies: Git, Linux, LaTeX, MySQL, FAISS, Streamlit, PTC Creo, MS Excel, MS PowerPoint

Cloud & MLOps (beginner): AWS, Docker, Kubernetes, MLflow, DVC, Streamlit

Experience

Research Intern, Energy Research Institute @ NTU (ERI@N) – Singapore Mar 2024 – Dec 2024
- Enhanced a Model Predictive Control system using an LSTM network for building HVAC management, driving 25–40% energy use reduction.
- Integrated machine learning based MPC algorithm into a BACnet-based BMS in collaboration with Ngee Ann Polytechnic, leveraging MySQL for scalable deployment.
- Leveraged technologies including Linux, MySQL & PyTorch for scalability and performance.

Electromechanical Design Engineer, Schneider Electric – Coimbatore, India July 2022 – Aug 2023
- Spearheaded R&D optimization for the TFTQ low-voltage switchboard line, delivering a closed-door operation (CDO+) feature that boosted orders by 20% and met IEC 61439 standards.
- Integrated temperature & humidity sensors for real-time thermal monitoring, improving reliability and enabling preventive maintenance workflows.
- Tools leveraged: PTC Creo Parametric, MS Excel, MS PowerPoint

Education

Nanyang Technological University, MSc in Computer Control & Automation – Singapore Jan 2024 – present
CGPA: 4.42/5.0
- Relevant Coursework: Genetic Algorithms & Machine Learning, AI & Data Mining, Neural Networks & Deep Learning, Machine Vision, Natural Language Processing, Robotics & Intelligent Sensors.

College of Engineering, Trivandrum, B.Tech in Electrical & Electronics Engineering – India Aug 2018 – July 2022
CGPA: 9.71/10.0
- Relevant Coursework: Linear Algebra, Probability & Statistics, Calculus, Signals & Systems, Digital Electronics.

Projects

ML-Based Semantic Description for Smart Buildings

Python · Ultralytics YOLOv8 · Mistral-7B · Gemini 2.0 flash · FAISS · RAG · JSON · Brick Schema
- Built a multi stage pipeline to convert service-drawing PDFs/images into Brick Schema.
- Detected components using YOLOv8, built relationships among them via heuristics & LLM prompting to produce a JSON graph.
- Employed an RAG-enhanced LLM (with Brick ontology docs) to generate the final Brick Schema file.
- Evaluated against manually curated schemas:
  - Avg F1 (classes): 93.85% • Avg F1 (edges): 80.69%.

Resume Job Description Matcher

Python · Streamlit · Hugging Face Transformers · PyTorch
- Deployed a Streamlit app which classifies resumes into 24 job categories, matches resumes to job descriptions as No Fit / Potential Fit / Good Fit, parses skills via spaCy NER to highlight gaps & recommend keywords.
- Fine-tuned BERT (Hugging Face) on matching and NER tasks, achieving robust precision/recall.

Human Action Recognition in Low-Light Conditions

Python · NumPy · Pandas · Scikit-learn · PyTorch (ViT)
- Designed a video-classification pipeline for 2–3 s clips under poor illumination: frame sampling → feature extraction → normalization → classification (Gaussian NB, Logistic Regression).
- Prototyped Vision Transformer models in PyTorch to push beyond traditional ML baselines.

Certifications & Extracurriculars

- Programming for Everybody in Python, Coursera.
- Supervised Machine Learning: Regression and Classification, Coursera.
- NTU GSA Administration Subcommittee Member (organized volunteering & team-building).
- National Service Scheme Volunteer (240 hours community service).